



BURLINGTON

Skyway

**water pollution
control plant**

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ONTARIO WATER RESOURCES COMMISSION

Division of Plant Operations

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1967

Burlington Skyway : water
pollution control plant.
81233



ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET, TORONTO 5
OFFICE OF THE GENERAL MANAGER

Members of the Burlington Skyway Local Advisory Committee,
Town of Burlington.

Gentlemen:

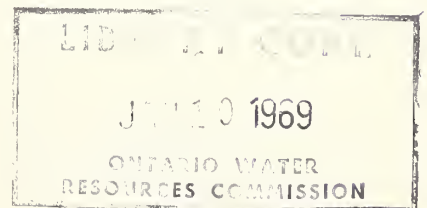
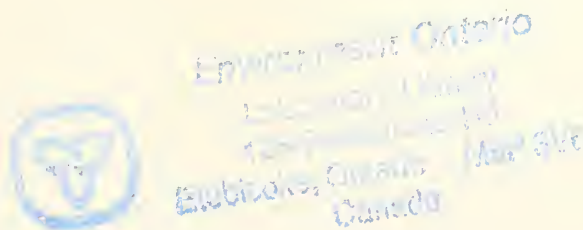
We are happy to present you with the 1967 Operating Summary for the
Burlington Skyway Water Pollution Control Plant, OWRC Project No.
2-0105-62.

Your co-operation with our staff throughout the year has been appreciated.
Only with such co-operation can the war against water pollution be waged
effectively.

Yours very truly,

A handwritten signature in dark ink, appearing to read "D. S. Caverly".

D. S. Caverly,
General Manager.





ONTARIO WATER RESOURCES COMMISSION

801 BAY STREET
TORONTO 5

J. A. VANCE, LL.D.
CHAIRMAN

J. H. H. ROOT, M.P.P.
VICE-CHAIRMAN

TELEPHONE 365-

D. S. CAVERLY
GENERAL MANAGER

W. S. MACDONNELL
COMMISSION SECRETARY

General Manager,
Ontario Water Resources Commission.

Dear Sir:

I am pleased to submit to you the 1967 Operating Summary for the Burlington Skyway Water Pollution Control Plant, OWRC Project No 2-0105-62.

The summary reviews progress during the year, outlines operating problems encountered and summarizes in graphs, charts and tables all significant flow and cost data.

Yours very truly,

A handwritten signature in dark ink, reading "D. A. McTavish". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

D. A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

FOREWORD

● This operating summary has been prepared in order to acquaint readers with the management of the project during 1967. The efficiency of the plant's operation is reflected in a general review. Significant financial details are recorded, and technical performance is illustrated by graphs and charts.

The summary should answer two salient questions. Are the project's facilities adequate at this time? And can the project meet future requirements?

The Regional Operations Engineer is primarily responsible for the preparation of the report, and will be pleased to answer any questions regarding it.

Most of the material for the graphs and charts was compiled by the statistics section of the Division of Plant Operations, with the final versions of the graphs being drawn by the draughting section of the Division of Sanitary Engineering. Cost data were provided by the Division of Finance.

It will be evident from the report that all of these groups co-operated with substantial success.

C O N T E N T S

Foreword	1
Title Page	3
'67 Review	5
Project Costs	6
Operating Costs	7
Process Data	10
Conclusions	Inside back cover

BURLINGTON
Skyway
water pollution control plant

operated for

THE TOWN OF BURLINGTON

by the

ONTARIO WATER RESOURCES COMMISSION

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VICE-CHAIRMAN: J. H. H. Root, M. P. P.

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Assistant Director: C. W. Perry
Regional Supervisor: A. C. Beattie
Operations Engineer: R. S. McKittrick

801 Bay Street Toronto 5



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'67 REVIEW

The 1967 operating costs for the Burlington Skyway plant were \$64,725.24 or \$45.60 per million gallons treated. The increase in operating costs over 1966 is 8.3 percent.

A total of 1419.27 million gallons of raw sewage was treated in 1967 which is a 40 percent increase over 1966.

The plant efficiency was generally excellent with average effluent qualities meeting OVRC objectives. Raw sewage strengths were considerably lower in 1967 averaging 101 ppm BOD and 160 ppm SS as compared to 186 ppm BOD and 206 ppm SS in 1966.

The sludge return facilities are generally inadequate to accomodate flows in excess of design or when aeration sections are drained for diffuser cleaning. Some activated sludge is lost during these periods.

The "precision tube" air diffusers are subject to blockage and this has necessitated frequent cleanings at considerable expense. Improved air filtering together with replacement of the diffusers is presently being considered.

Staff re-allocation has doubled the size of the maintenance staff to two men. The re-assignment of one operator to Waterdown and the resignation of a second, left the Burlington projects short staffed for part of the year. This shortage was partially filled by casual labour and D. McFerran was hired in October as an operator trainee. The second operator's position will be filled early in 1968.

PROJECT COSTS

NET CAPITAL COST (Estimated)	\$1,796,844.53
DEDUCT - Portion Financed by CMHC (Estimated)	<u>1,240,059.57</u>
Long Term Debt to OWRC	\$ <u>556,784.96</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1967	\$ <u>101,802.44</u>
Debt Retirement	\$ 20,200.00
Reserve	11,037.10
Interest Charged	31,399.04
Net Operating	<u>64,725.24</u>
TOTAL	\$ <u>127,361.38</u>

RESERVE ACCOUNT

Balance at January 1, 1967	\$ 46,930.90
Deposited by Municipality	11,037.10
Interest Earned	<u>2,905.81</u>
	\$ 60,873.81
Less Expenditures	<u>(1,647.60)</u>
Balance at December 31, 1967	\$ <u>59,226.21</u>

MONTHLY OPERATING COSTS

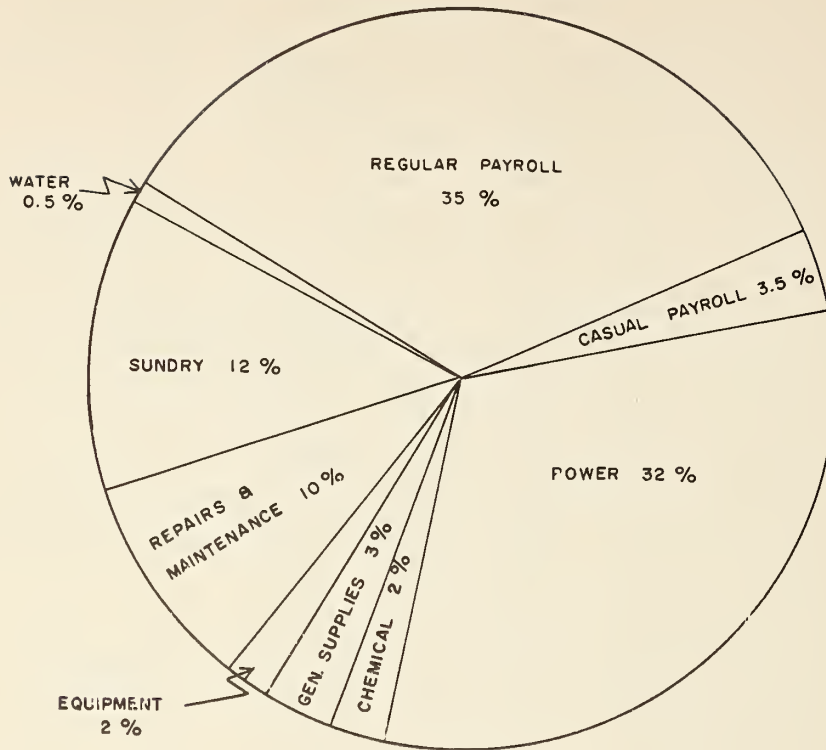
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY	WATER
JAN	4,151.47	1,744.61		1,599.22		65.77	61.78	14.49	13.12	36.1
FEB	4,351.92	1,690.12		1,560.14		50.76		204.47	511.95	31.08
MARCH	4,690.00	1,690.11		1,601.78		273.85		754.56	413.09	30.15
APRIL	4,617.39	1,826.35		1,866.10		172.41	17.29	621.56	142.1	31.15
MAY	4,561.47	1,685.11		1,644.33		122.31	30.36	241.62	600.22	30.15
JUNE	5,944.22	1,670.54	151.20	1,413.77	1,496.35	97.73		214.48	111.21	32.60
JULY	4,321.49	1,318.92	649.93	1,477.24		141.60		23.31	599.56	41.73
AUG	4,469.89	1,500.67	647.61	1,811.92		54.73		51.03	378.51	26.42
SEPT	5,747.92	2,317.59	589.46	1,726.39	93.75	117.26		291.65	524.33	31.09
OCT	5,360.70	1,542.70	131.28	2,156.95		175.65		537.43	562.30	31.50
NOV	5,110.03	1,324.11		1,746.22	20.58	486.47	208.99	1,536.59	2154.90	30.15
DEC	7,691.40	1,888.30		1,770.58		215.66	962.39	1,548.10	1181.22	31.15
TOTAL	64,726.24	20,389.91	2,315.38	20,496.91	1,612.68	1,974.20	1,280.81	6,136.62	8092.48	424.24

* SUNDRY INCLUDES SLUDGE HAULING COSTS WHICH WERE \$5,043.46

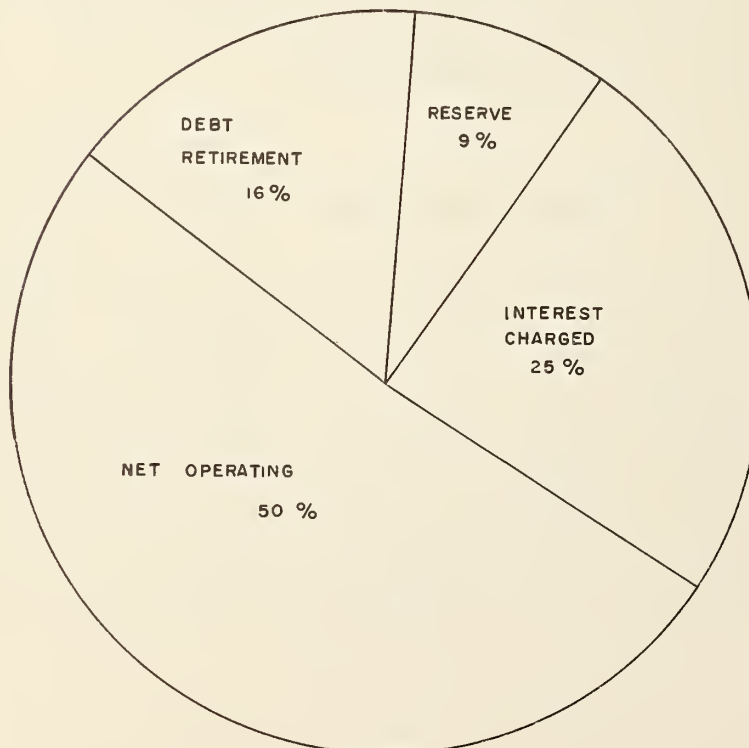
YEARLY OPERATING COSTS

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER LB OF BOD REMOVED
1964	271,006+	\$43,402.99	\$160.15	8 CENTS
1965	365,290	51,736.82	53.60	3 CENTS
1966	1011,463	59,744.34	59.07	3 CENTS
1967	1419,273	64,726.24	45.60	5 CENTS

1967 OPERATING COSTS



TOTAL ANNUAL COST



Process Data

A total of 1419.27 million gallons of raw sewage was treated at the Burlington Skyway plant in 1967. This represents an increase of 40 percent over 1966. The average daily flow for the year was 3.89 mg. The maximum flow for one month occurred in October with a total flow of 161.48 and an average daily flow of 5.21 mg. The minimum flow for one month of 82.30 mg, an average daily flow 2.65 mg, occurred in January. The peak daily flow of 10.18 mg occurred in October as did the maximum flow rate of 12.4 mgd. The design flow rate of 3.13 mgd was exceeded 80 percent of the time in 1967 as compared with 26 percent of the time in 1966.

The following graphs and charts indicate quite clearly the yearly trends and monthly fluctuations in flows to the plant.

FLOW DATA

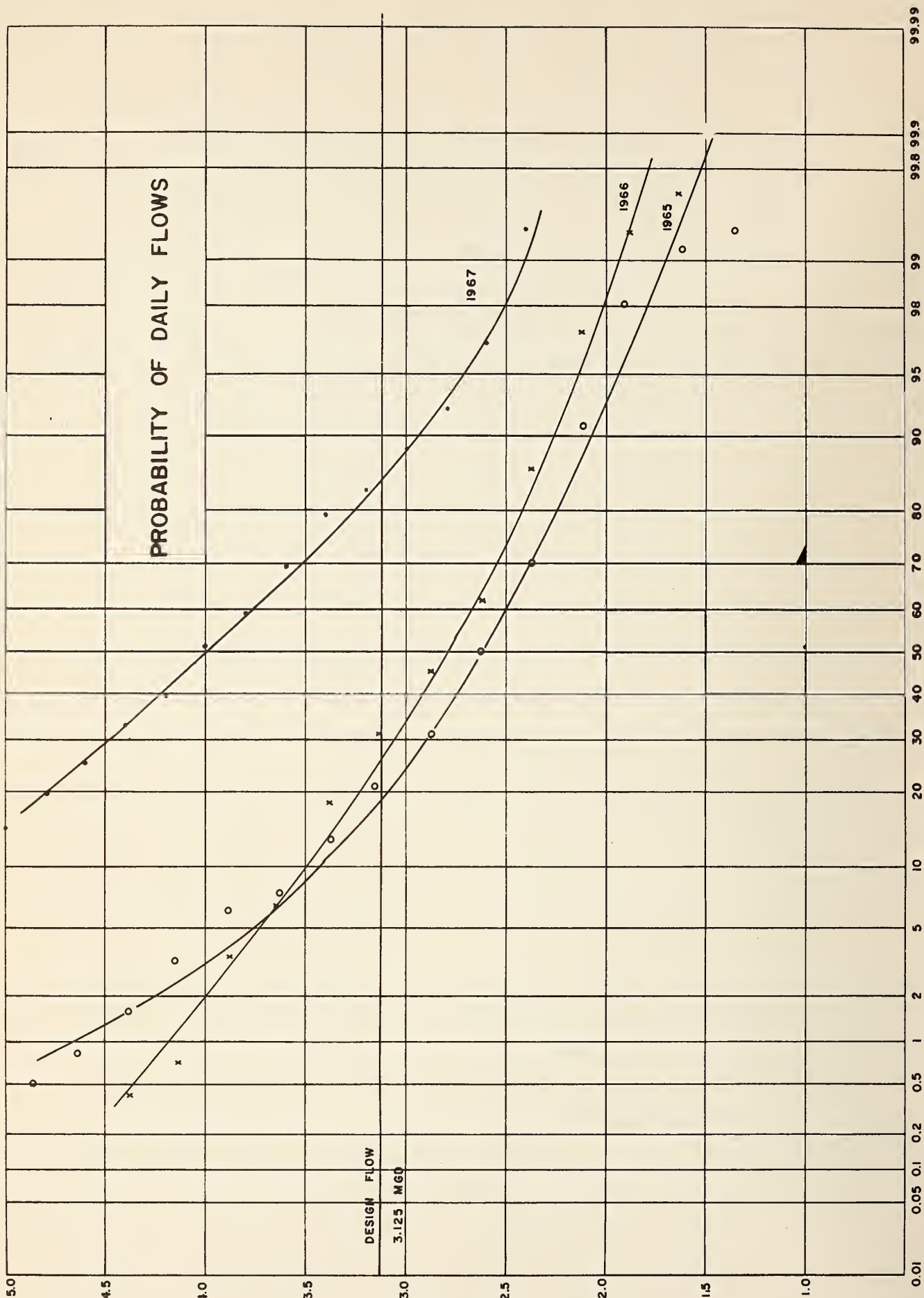
Month	Total Flow (MG)	Avg. Daily Flow (MGD)	Max. Daily Flow (MG)	Min. Daily Flow (MG)	Max. Rate (MGD)	Air. Flow (MGD)
January	82.304	2.654	4.030	1.680	4.0	.2
February	94.534	3.376	5.362	2.731	7.0	1.21
March	128.217	4.136	5.170	2.441	8.0	.6
April	134.871	4.496	5.377	3.391	7.8	2.4
May	120.652	3.892	4.544	2.660	8.0	2.2
June	117.920	4.066	5.189	2.588	7.0	1.7
July	117.963	3.805	5.027	2.270	8.6	.6
August	139.515	4.500	6.464	2.562	8.0	.6
September	105.095	3.503	4.609	2.483	7.8	.2
October	161.483	5.209	10.180	3.040	12.4	.4
November	105.448	3.515	4.641	3.284	8.5	.6
December	111.271	3.589	5.305	2.240	8.7	-
Total	1419.273	3.888				
Average	118.273					

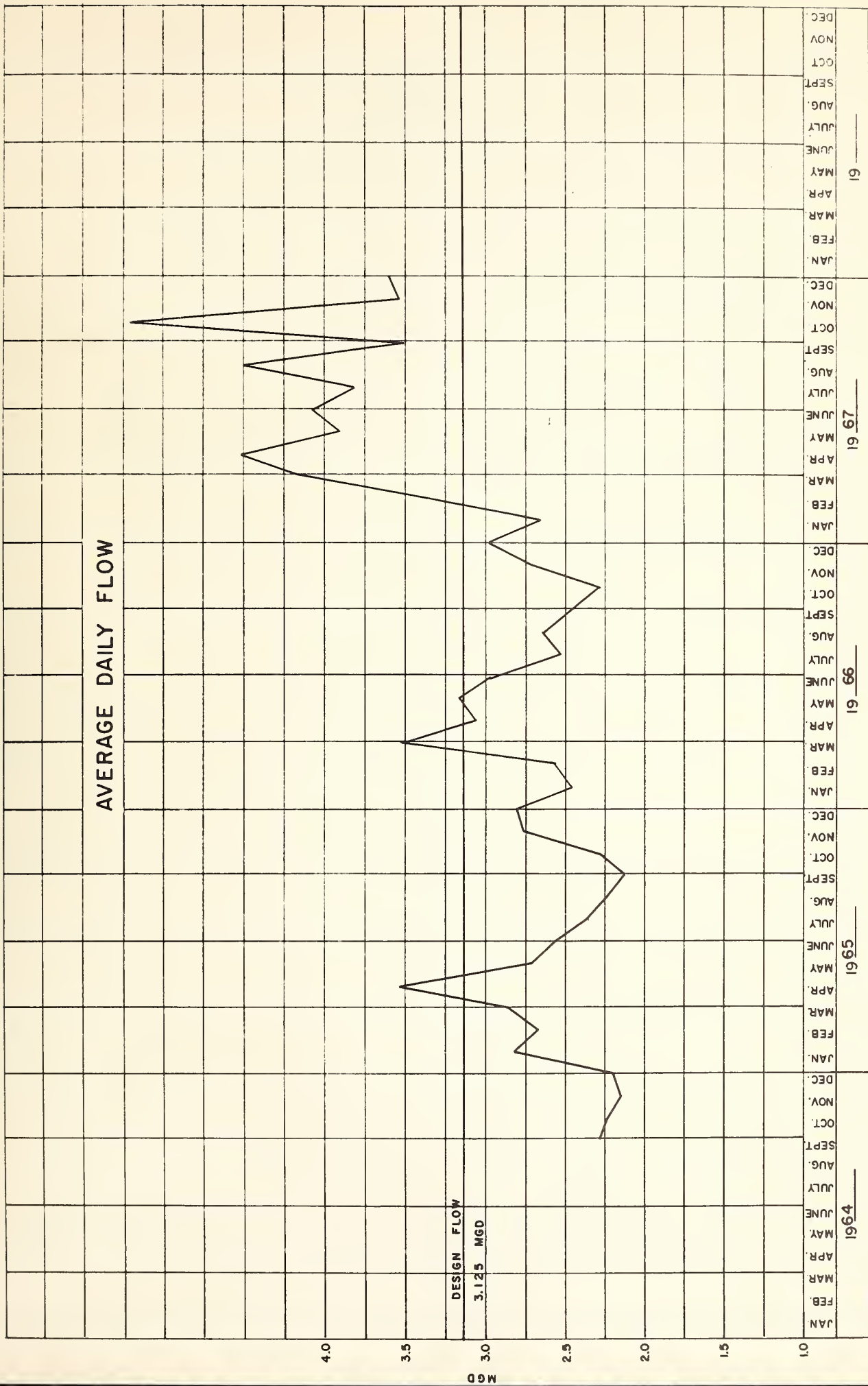
DESIGN FLOW

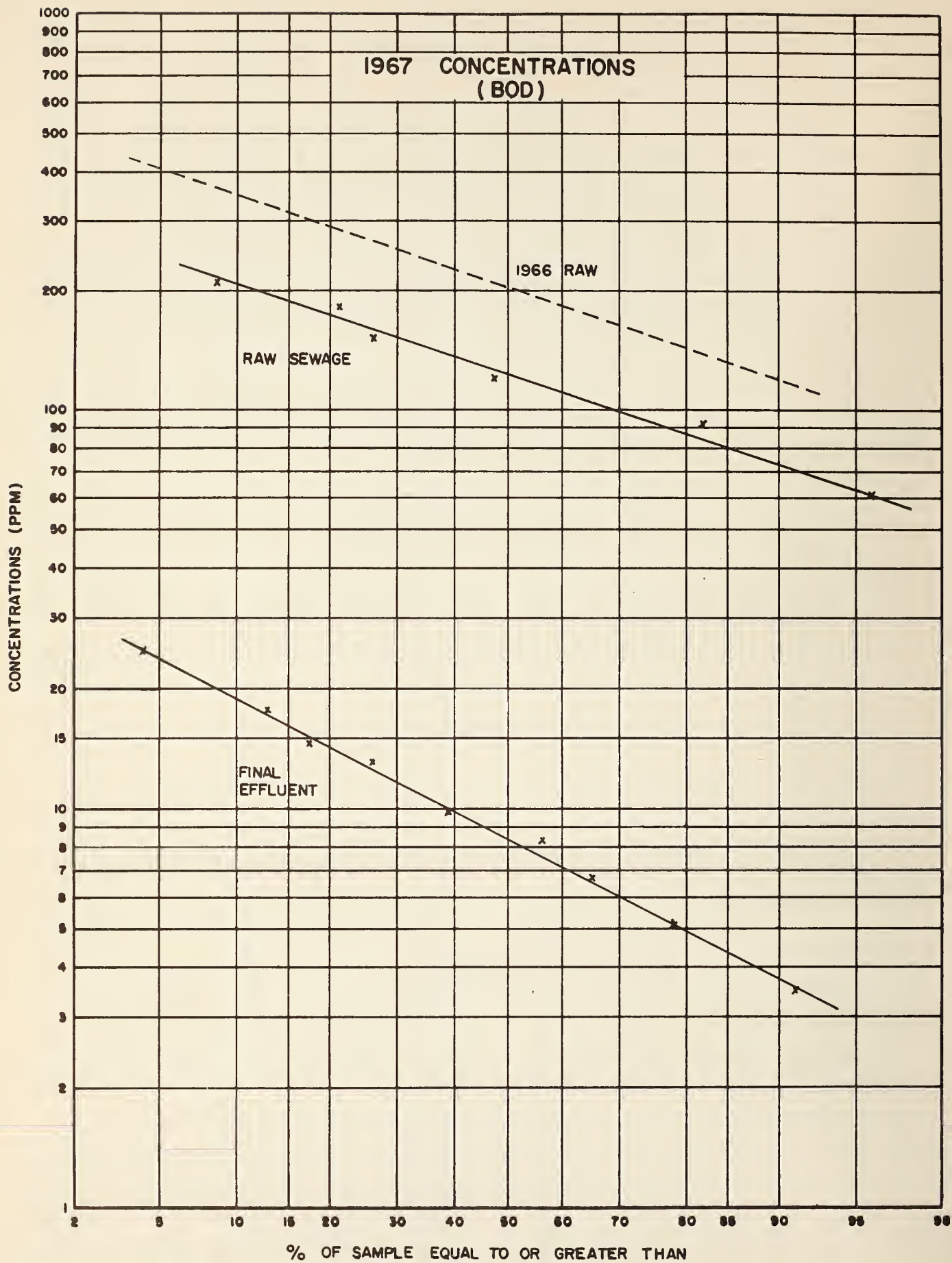
3.125 MG0

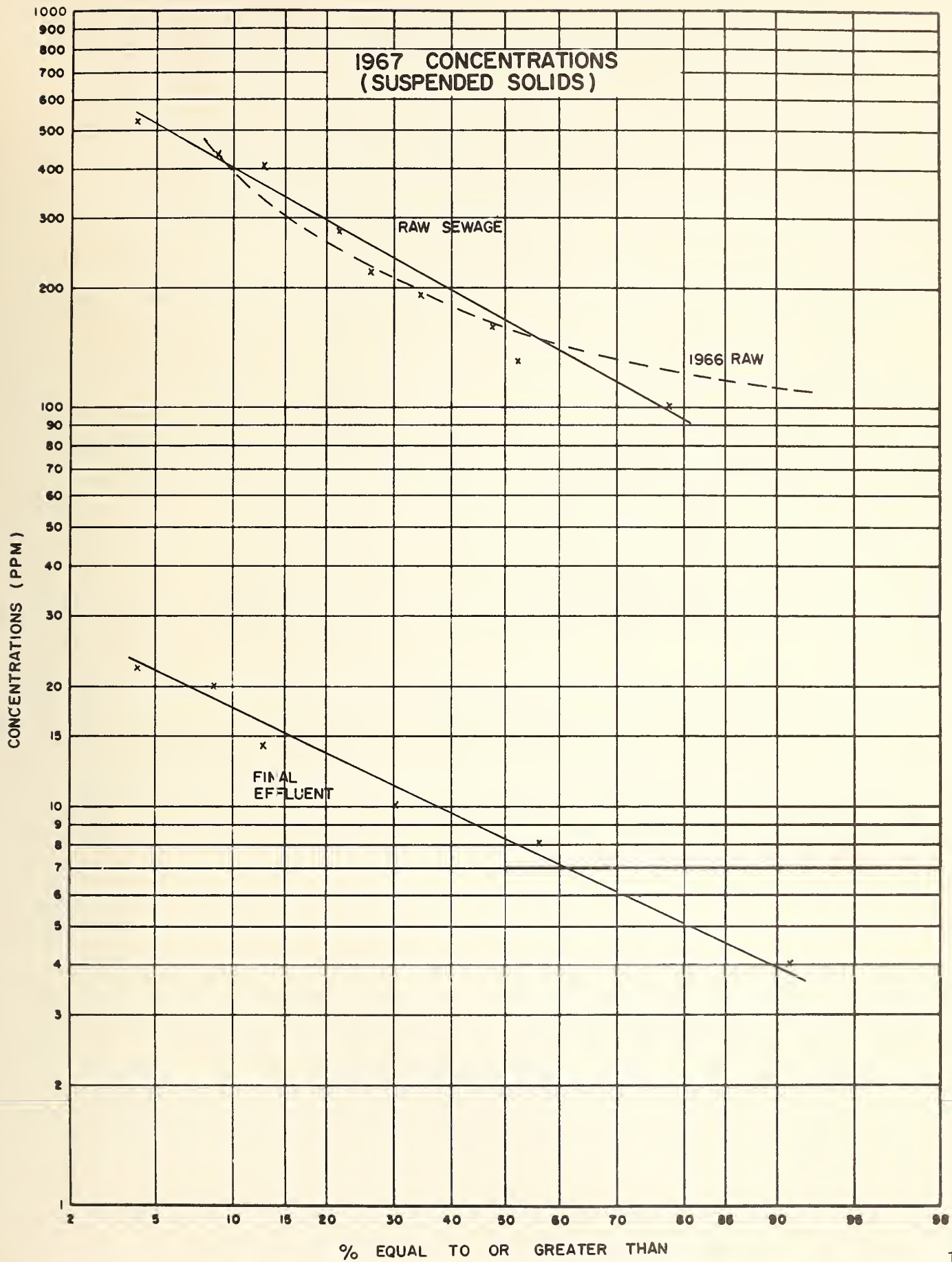
PROBABILITY OF DAILY FLOWS

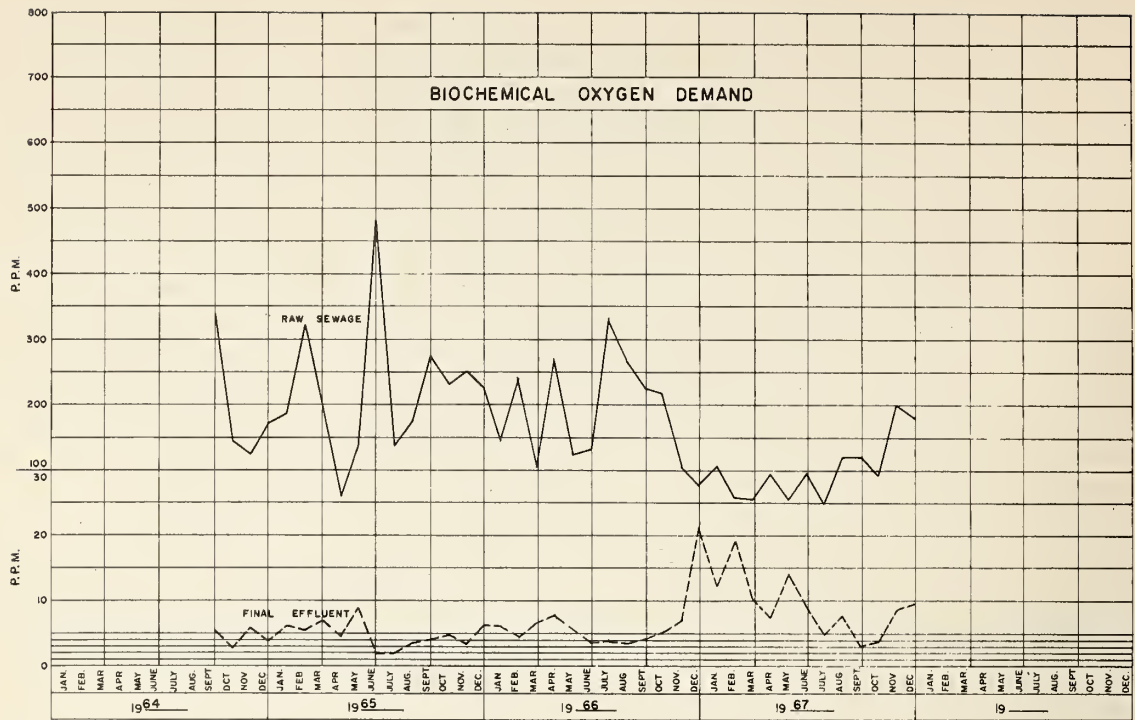
PERCENT OF TIME FLOW IS EQUAL TO OR GREATER THAN



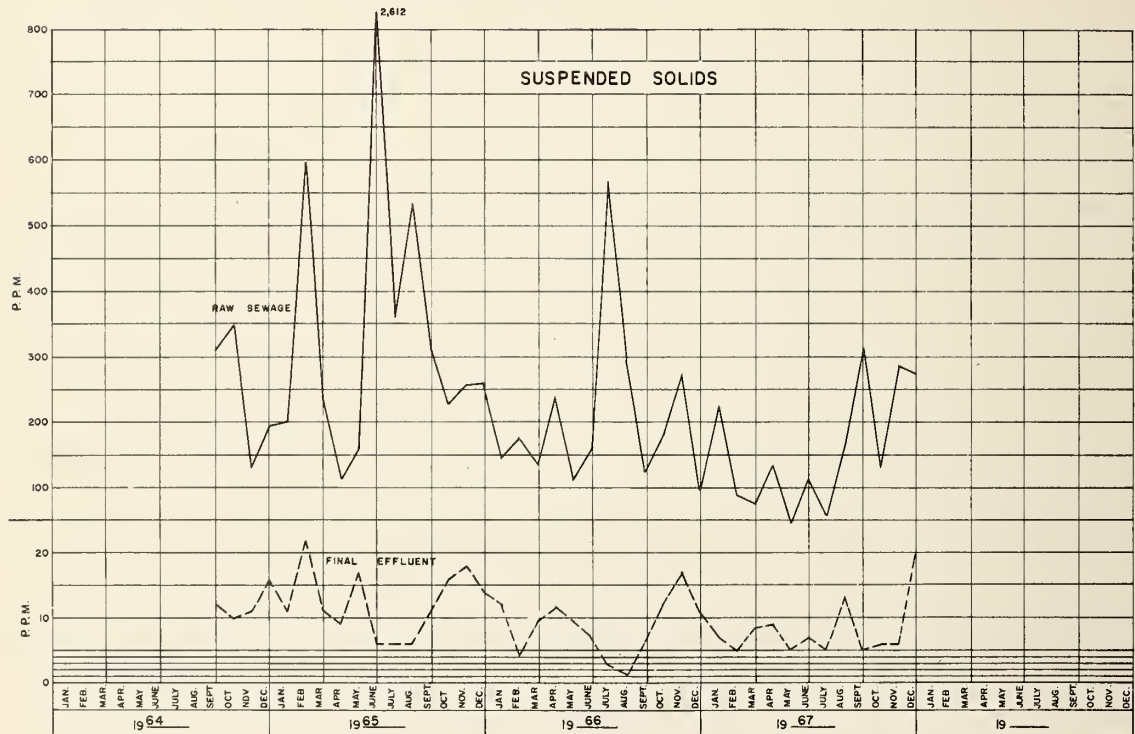








MONTHLY VARIATIONS



GRIT, B.O.D AND S.S. REMOVAL

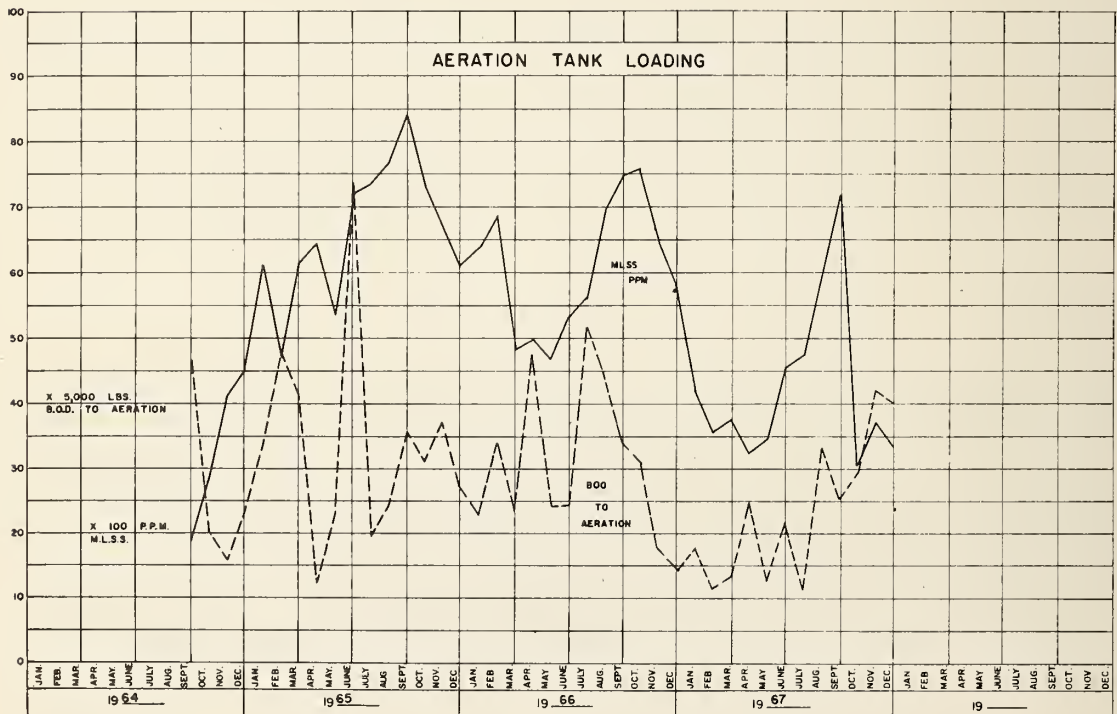
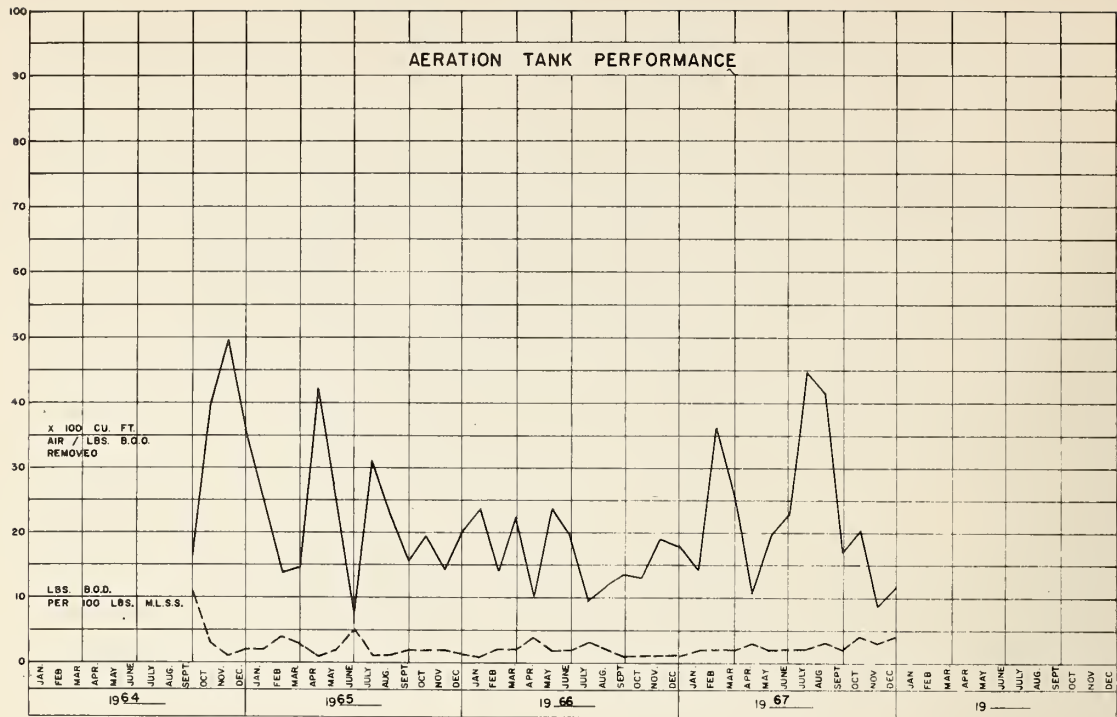
MONTH	B. O. D.				S. S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	INFLUENT PPM.	EFFLUENT PPM.	% REDUCTION	TONS REMOVED	
JAN.	108	12	88.9	39.51	226	7	96.9	90.12	70
FEB.	59	19	67.8	18.91	90	5	94.4	40.18	70
MAR.	52	10.2	80.4	26.80	74	8.5	88.5	41.99	140
APR.	92	7.4	91.9	57.05	135	9	93.3	84.97	110
MAY	53	14	73.6	23.52	46	5	89.1	24.73	190
JUNE	91	9	90.1	48.35	115	7	93.9	63.68	150
JULY	48	4.8	90.0	25.48	59	5	91.5	31.85	900
AUG.	119	7.6	93.6	30.00	169	13	92.3	108.82	690
SEPT.	120	3	97.5	61.48	314	5	98.4	162.37	900
OCT.	91	3.7	95.9	70.49	131	6	95.4	100.93	390
NOV.	200	8.7	95.6	100.86	288	6	97.9	148.68	235
DEC.	180	9.4	94.7	94.91	276	20	92.8	142.43	440
TOTAL	-	-	-	497.37	-	-	-	1040.75	4285
AVG.	101	9.1	88.3	49.78	160	8	92.9	86.72	357

COMMENTS

During 1967 there was a major reduction in the strength of the raw sewage as compared to the 1966 average values. The average BOD was 101 ppm in 1967 and 186 in 1966, and the suspended solids 160 in 1967 and 206 in 1966. When the large increase in flows is related to the average reduction in strength of the raw sewage, the excessive infiltration in the municipal collection system can be assumed. Further evidence which justifies this conclusion is the large increase in plant flow during periods of heavy run-off.

Treatment during the year was within OWRC objectives when considering the yearly average.

A total of 4285 cu. ft. of grit removed in 1967 is an increase of 48 percent over 1966.



AERATION SECTION

MONTH	PRIM. EFFL. B.O.D. PPM.	MLSS. PPM.	LBS. BOD. PER 100 LBS. M. L. S. S.	CUBIC FEET AIR PER LB. BOD. REMOVED
JANUARY	108	4205	2	1428
FEBRUARY	59	3587	2	3606
MARCH	52	3744	2	2552
APRIL	92	3237	3	1044
MAY	53	2477	2	1958
JUNE	91	4559	2	2231
JULY	48	4736	2	4482
AUGUST	119	6019	3	4148
SEPTEMBER	120	7190	2	1690
OCTOBER	91	3044	4	2029
NOVEMBER	200	3712	3	898
DECEMBER	180	3350	4	1177
TOTAL	-	-	-	-
AVERAGE	101 *	4261	3	2270

* Raw BOD - no primary.

DIGESTER OPERATION

SLUDGE FROM HOLDING TANK

<u>Month</u>	<u>Gallons</u>	<u>Month</u>	<u>Gallons</u>
January	156394	July	56187
February	67813	August	88368
March	108888	September	108500
April	40688	October	127876
May	98813	November	p78251
June	67779	December	73121
	Total	1172678	
	Average	97723	

COMMENTS

A total of 1, 172, 678 million gallons of waste activated sludge was removed from the sludge holding tank. There was a decrease in waste sludge removed in 1967 compared with 1966 as might be expected due to the large reduction in the applied organic load.

CHLORINATION

MONTH	PLANT FLOW (MG)	POUNDS CHLORINE	DOSAGE RATE (PPM)
JANUARY	82.304	93	1.75
FEBRUARY	94.534	-	-
MARCH	128.217	100	2.41
APRIL	134.871	-	-
MAY	120.652	2242	2.30
JUNE	117.920	3718	3.15
JULY	117.963	3986	3.38
AUGUST	139.513	3151	2.26
SEPTEMBER	105.095	2684	2.55
OCTOBER	161.483	1410	1.69
NOVEMBER	105.448	-	-
DECEMBER	111.271	-	-
TOTAL	1419.273	17384	-
AVERAGE	118.273	2897	2.44

COMMENTS

The final effluent is chlorinated for disinfection purposes between May 15 and November 1. An average dosage rate of 2.44 ppm was required to maintain a residual of 0.5 ppm.

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81233



Environment Ontario
Local Advisory Council
1155 Main Street Rd.
Etobicoke, Ontario M9P 3V6
Canada

RECOMMENDATIONS

The plant provided excellent treatment during 1967 with an average effluent quality well within OWRC objectives.

There was a major increase in total flows and a large decrease in raw sewage strength. This would indicate considerable ground and storm water infiltration to the municipal collection system. Since infiltration consumes valuable plant capacity, the municipality would be well advised to investigate and eliminate where possible all leaks in the collection system.

Due to rapidly rising flows expansion of the plant should be considered immediately for construction in the near future.

